Plant Document Analysis

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ENGINEERING SPECIFICATION ANALYSIS
Focus Area: Roof floatation test.
Generated on November 25, 2025

Below is a focused extraction and gap list for "Roof floatation test" based strictly on (A) industry-standard scope (codes referenced in the provided document) and (B) only the explicit statements and numbers present in the supplied BEDD. I do NOT infer or invent any test procedure steps or test acceptance criteria that are not present in the document.

Section 1: Accepted Specifications for Evaluation of Roof floatation test

• ASME / API design code for storage tanks:

• The document requires storage tanks to be designed per API 650 for atmospheric storage tanks (section 9.7.3 Mechanical design). (This is the project design code explicitly stated and is the authoritative code cited in the document for tanks.)

• Inspection / modification code reference:

• Modifications/repairs to tanks to follow API 653 (section 9.7.3 Mechanical design), i.e., API 650 for construction and API 653 for modifications/inspection.

• Material and corrosion allowance for storage tanks (relevant to tank buoyancy and integrity affecting floating roofs):

• Storage tank corrosion allowance: 1.5 mm for shell and bottom; roof corrosion allowance 1.0 mm (section 9.6.1 Corrosion allowances).

• Minimum nozzle size on pressure vessels (may apply to nozzles on tank internals/attachments where applicable):

• On pressure vessels minimum nozzle size shall be 1 ½" (section 9.7.4 Spheres and Bullets — stated as general pressure vessel minimum nozzle size).

• Safety / instrumentation note relevant to floating roofs:

• Linear heat detectors for floating roof tanks are required (section 9.8.1 Gas detectors and detectors sentence: "Gas detectors, linear heat detectors for floating roof tanks, ROR heat detectors for clean agent system shall be provided..."). This identifies that floating roof tanks are within scope of fire/heat detection measures.

• Project design life relevant to tank lifetime used in acceptance decisions:

• Design life for all J3 units set as 20 years unless different figure specified by licensor (section 2.1 Project life).

Section 2: Measurements Provided in Document

• The document contains no explicit measurement values or test acceptance criteria for a "roof floatation test" (no test pressures, freeboard limits, flotation thresholds, leak rate limits, roof weight limits, or measured forces/moments for floating roofs are provided in the BEDD).

• Explicit numeric items in the document that are relevant to tank/flotation context (but not explicit roof floatation test values):

• Corrosion allowance for storage tanks: shell & bottom = 1.5 mm; roof = 1.0 mm (section 9.6.1).

• Manhole / manway size minima for vessels (may be applicable for tank access):

• For vessel dia 900–1500 mm: 20" NB; above 1500 mm: 24" NB; minimum ID of manhole shall be 20" (section 9.7.1 Manways).

• Minimum vent/drain nozzle sizes on vessels (indicative of required small nozzles provision):

• Vent up to 6 m3: 1½"; above 6 m3: 2" (section 9.7.1 Vessels will be provided with vent and drain nozzles).

• Drain up to 6 m3: 1½"; 6.1–15 m3: 2"; above 15 m3: 3".

• Design life: 20 years (section 2.1).

• Codes to be used: API 650 (storage tanks), API 653 (modification/inspection) noted above (section 9.7.3).

Section 3: Inputs and Additional Requirements from Client (explicit in the document or explicitly missing)

• Inputs explicitly in the document:

• Codes to use for tanks: API 650 (construction) and API 653 (modifications) — doc requires these codes to be followed (section 9.7.3).

• Corrosion allowances for tanks (1.5 mm shell/bottom, 1.0 mm roof).

• Floating roof tanks are included in fire/heat detection scope (linear heat detectors specified).

• Project design life of 20 years (affects allowable corrosion and inspection intervals).

• Information that the document calls out as required but does NOT provide (i.e., missing/needed to perform a Roof floatation test):

• No floating roof test procedure is included in the BEDD (no stepwise test, no referenced test standard/procedure for "roof floatation test" is provided).

• No acceptance criteria for roof flotation or operation (e.g., required freeboard, permitted sticking, tilt limits, leak rates, allowable seal leakage, deck loading limits, roof sinking detection thresholds).

• No test instrumentation or measurement points specified for a flotation test (e.g., locations to measure deck deflection, clearance to shell, compartment water levels, roof rotation/tilt sensors).

• No numeric test pressures, fill levels, or sequence for a flotation test (e.g., water fill depths, compartment fill order, incremental checks).

• No vendor or licensor floating roof data sheets or floating roof manufacturer requirements are included — the document defers to Licensor / BEC / DEC for detailed MOC, datasheets and specific design limits (multiple sections: 9.6, 9.7).

• No tank-specific geometry or weights in the BEDD (tank diameter, roof type — pontoon, double-deck, vapor-mounted, seals type — primary/secondary, number/size of pontoon compartments) which are required inputs to plan and execute a floatation check/test.

• No explicit requirement for hydrostatic or leakage acceptance test for floating roofs (the BEDD gives API 650 as design code but does not extract specific test clauses).

• No defined inspection/test frequency or reporting format for roof floatation checks.

• Recommended document-level actions (explicitly consistent with the BEDD's approach of deferring to licensors and DEC):

• Obtain licensor / vendor floating roof data sheet and manufacturer recommended commissioning/test procedure.

• Confirm whether API 650 / API 653 test clauses and relevant annexes apply for the specific floating roof type; request DEC to provide the detailed test procedure and acceptance criteria (BEDD directs licensor/DEC to provide detailed MSDs and datasheets — section 9.6 and 9.7).

• Provide tank-specific parameters required to prepare a floatation test plan: tank ID, tank diameter, roof type, deck deadweight, compartmentation, seal details, design liquid specific gravity, maximum allowable deck tilt, required freeboard, access nozzles/manholes, and required detection instrumentation (some of these items are explicitly required elsewhere in the project to be provided by Licensor/BEC/DEC per BEDD).

Summary / Conclusion

• The BEDD identifies API 650 (construction) and API 653 (modification/inspection) as the controlling storage tank codes and supplies material/corrosion allowances and some general vessel/nozzle/manway sizing, and explicitly includes floating roof tanks in the fire/heat detection scope. These are the only items in the document that are directly applicable to planning tests and inspection of floating roofs.

• The BEDD does not provide any explicit roof floatation test procedure, acceptance criteria, required measurements, test levels, or specific tank parameters necessary to perform a roof flotation test. To proceed with a compliant roof floatation test, you must obtain the tank-specific data and the detailed test procedure and acceptance criteria from the licensor/vendor or DEC (and confirm which clauses of API 650 / API 653 or vendor standards are to be used for testing and acceptance).

• Draft a checklist of the exact tank-specific data and documents to request from Licensor / Vendor / DEC to prepare a roof flotation test plan, or

• Draft an outline roof flotation test plan template mapped to API 650 / API 653 clauses (marked as a draft to be finalized once tank-specific inputs and licensor/vendor test criteria are provided). Which do you prefer?

End of Engineering Analysis Report